



Alan C. Lloyd, Ph.D.  
Agency Secretary  
Cal/EPA



## Department of Toxic Substances Control

---

8800 Cal Center Drive  
Sacramento, California 95826-3200



Arnold Schwarzenegger  
Governor

### MEMORANDUM

TO: Barbara Cook, P.E.  
Branch Chief, Northern California Cleanup Operations  
Department of Toxic Substances Control (DTSC)  
700 Heinz Avenue, Suite 200  
Berkeley, California 94710-2721

FROM: J. Michael Eichelberger, Ph.D.  
Associate Toxicologist  
Human and Ecological risk Division (HERD)

Alan Fone, Ph.D.  
Hazardous Substances Scientist  
Department of Toxic Substances Control

DATE: October 4, 2005

SUBJECT: Zenecda/Former Stauffer Chemical Site, Site Inspection, Landscape Plant Health

PCA: 11050      Site: 201567-00

---

### Background

A site inspection of the Zeneca/Former Stauffer Chemical Site (Zeneca Site) and other immediately adjacent areas was conducted in response to concerns by local citizens that symptoms of poor health and death among landscape trees and shrubs at the site are caused by soil and groundwater contaminants. Inspection participants included staff from the Department of Toxic Substances Control, Dr. Robert Raabe, emeritus professor of plant pathology from the University of California Berkeley, Mr. Blaine Brende of Brende & Lambe Tree & Shrub Care, representatives from LFR and the property owner, and Ross Nadeau of SWA, the landscape architect overseeing the site. A list of attendees participating in the inspection is included with this memorandum.

## **General Comments**

Dr. Raabe inspected each species of landscape plant that exhibited symptoms of poor growth, non-typical color, or appeared to be dead or was dying. Although overall plant vigor and health were poor among many of the landscape plantings, most, if not all cases, were caused by disease, infestation by plant pests, poor irrigation management, poor plant selection for the site, or a combination of these factors. Horticultural practices, especially water management, were discussed with the landscape architect for each of the areas that were inspected. A description of causative agents diagnosed for each species is outlined below.

## **Specific Comments**

1. Ornamental pears. Inspection of trees adjacent to Meade street, showed diagnostic characteristics of fire blight. Fire blight is a disease caused by a bacterium that infects the blossoms of the plant. The disease spreads to the branches and trunk where cankers can form that girdle the tree. The disease is lethal and pears are very susceptible. Although symptoms are diagnostic for fire blight, Dr. Raabe recommended confirming this diagnosis by sampling the trees for the bacterium that causes the disease.
2. Star Jasmine. These plants grow best in shaded areas rather than the fully sun-exposed areas where they are planted at the Zeneca site. Star jasmine plant at the site are showing signs of chlorophyll destruction caused by too much sunlight. The red-color in the leaves result from "accessory" pigments that are normally masked by the predominance of chlorophyll. Saturated, poorly drained soils are also stressing the plants.
3. Tristania (also called Vinegar Tree and Brisbane Box). Saturated soils were found in areas where these trees have died or are showing poor health. Dr. Raabe found brown stained wood under the tree bark at ground level. This condition is diagnostic of root rot, which is caused by a "water mold." A group of organisms similar to fungi. Water molds thrive in water saturated soils. Infection in one tree becomes a source of infection for other trees in the same planting. The disease is lethal

Many of the older leaves of the tristania trees had dead margins. This is typical of salt damage, possibly resulting from the over application of fertilizers. Salts may be accumulating in the upper soil because of poor drainage that was observed in some areas.

Some tristania trees had yellowing leaves with dark green veins. This is a symptom of iron deficiency. The results of soil tests have indicated that the soil is alkaline, a condition that makes iron less available to plants. This soil condition is treatable by lowering the pH of the soil and/or applying chelated iron.

4. Strawberry Tree. Misshapen leaves were infested with aphids. A gray sooty mold associated with honeydew excretions from the aphids was covering many of the leaves. These plants were growing in planter boxes and therefore, they were not in direct contact with the site's soil.
5. Maples. Although the maples planted in the parking lot medians were largely defoliated, their stems, bark, and buds, appeared healthy. Persistent prevailing winds are suspected as the cause for leaf loss in these trees.
6. Poplars. Although these trees are not located on the Zeneca Site, concerns have been raised about soil contaminant toxicity to these trees. These trees were not examined during the September 9<sup>th</sup> inspection, However Dr. Raabe reported that he had looked at some of these trees and had found them infected with a rust fungus. This fungus causes a foliar disease of this species and during severe infections, may cause at least some leaf loss.
7. Alders. In an area on-site between a building and Meade Street, planted alders appeared to be in decline. The species of the alder is unknown, and the cause of their decline is not understood. Alders have a relatively short life span, and California's native species show decline after about 60-years. The age of the planted trees is unknown. The alder trees should be identified to species and their age should be determined. Once species identification has been determined, the trees should be evaluated with respect to horticultural and ecological requirements and for the presence of species-specific plant diseases and pests.
8. Ginkgo. Three ginkgo saplings off-site showed poor vigor and yellowing of the leaves (chlorosis). The location of these trees along South 49<sup>th</sup> Street is not favorable for this species because they are subject to frequent wind. The leaf yellowing includes the veins, which indicates that the trees may be suffering from nitrogen deficiency. The trees are planted in a sidewalk planting area and they do not appear to have received much care other than staking.
9. Eucalyptus. A row of trees planted in a row along South of 49<sup>th</sup> Street adjacent to building 240, on the Zeneca site, are heavily infested with lerp psyllid's, an insect pest native to the tree's home range in Australia. The pests were first discovered in California in Los Angeles County in June 1998. Lerp Psyllid's have since been found in many other parts of the state and have been found on Eucalyptus in many east bay locations. The pest attacks the leaves, feeding on the plants sap which weakens the trees, and makes them susceptible to fatal attacks by other plant pests.

One senescent Eucalyptus planted on S. 49<sup>th</sup> Street has several dead branches, most on the side of the tree facing the capped area. Dr. Raabe did not note any obvious signs of pest or disease organisms that might be responsible for the plant's poor condition. For instance, the tree did not appear to be infested with

the lerp psyllid. Asphalt and concrete cap much of the ground overlying the tree's rooting zone. Soil sampling within the drip line of the tree may be appropriate to rule out soil contamination as a causative agent for decline of the tree.

## Conclusions

Many landscape plants at the Zeneca site are infected with disease organisms, infested with plant pests or suffering the effects of saturated soils resulting from over-watering and poor drainage. Poor drainage and saturated soils are conducive for disease development and low vigor. Plant health issues related to the soil water status appears to be causing nutritional imbalance as exemplified by iron deficiency. Certain species such as the maple may have not been planted in the most favorable locations because of the steady, prevailing wind.

Although it is probable that plant death and poor health at the Zeneca site are the result of plant disease, plant pests and/or poor water balance in the soil, other soil characteristics could be a contributing factor. Mr. Nadeau, the landscape architect from SWQ, reported that a minimum of 18 inches and a maximum of five feet of topsoil were imported prior to planting. This soil had been tested to determine its suitability for plant growth. However, test results for this imported soil could be re-examined to verify that the imported soil is not a possible cause of poor plant health.

In cases where poor plant health does not seem to be associated with disease, pests or adverse soil moisture conditions, sampling and testing of soil may be indicated. This is the case for one eucalyptus tree on South 49<sup>th</sup> Street. Soil within the drip line of this tree's canopy should be sampled and tested for hazardous substances known to occur in soil at the Zeneca site that may affect plant vigor and survival.

Reviewed by: David Berry Ph.D.  
Senior Toxicologist  
Northern California Region

cc: Michael Anderson, Ph.D.  
Staff Toxicologist  
Human and Ecological Risk Division  
Department of Toxic Substances Control  
8800 Cal Center Drive  
Sacramento, CA 95826

# **Former Zeneca Inc. Richmond Facility/Campus Bay Site, Richmond, California**

## **Site Vegetation Meeting**

### **Attendees:**

Dr. Robert Raabe – Professor Emeritus, UC Berkeley  
Blaine Brende – Brende and Lamb Tree and Shrub Care  
Barbara Cook – Department of Toxic Substances Control (DTSC)  
Lynn Nakashima – DTSC  
Michael Eichelberger Ph.D. – DTSC  
Allan Fone Ph.D. – DTSC  
Bill Collins – Simeon Properties  
Ross Nadeau – SWA Group  
Bill Carson – LFR Levine Fricke  
Andrew Romolo – LFR Levine Fricke



Ornamental pear trees along Meade Street. Trees with denuded branches and dark, scorched-looking leaves are infected with fire blight.





Ornamental pear tree. Bark removed to show symptoms of fire blight.



Star jasmine at the site, showing effects of chlorophyll destruction by excessive exposure to direct sun. Destruction of chlorophyll results in the loss of green leaf color and the appearance of reddish pigments normally masked by the presence of chlorophyll.



Base of Tristania tree trunk with bark removed to show signs of infection by a water mold, which causes root rot.





Tristania leaves showing symptoms of salt damage.



Tristania leaves with yellowing in between veins, a symptom of iron deficiency.



Aphid infestation on strawberry tree. Note gray sooty mold on leaves.



Eucalyptus tree on South 49th Street with dead, leafless branches on the side of the tree away from the road.